

REMARKS

The rejections under 35 USC 102 and 103 are respectfully traversed as being moot in view of the amendment.

The limitation of a range of 1 - 5 per cent for the flexibilizing agent has been inserted in claims 1 and 18. It should be noted that this range is taught away from by the Christie reference, which does not mention the compounds listed in claim 8; and by the Dershem reference, which specifies a range (15% - 60% in Col. 14, line 19) that has a lower bound that is three times greater than the upper bound in claim 1, from which claim 8 depends.

With respect to claims 8 and 31, the inventor has informed Applicant's attorney that "internally epoxidized 1,3-butadiene homopolymers" are structurally different from the "polybutadienes" referred to by Dershem and cited by the Examiner, in that the compounds in question have the factional group referred to by the term "epoxidized". Accordingly, claims 8 and 36 have been amended to delete "copolymers of butadiene" but retain the term "internally epoxidized 1,3-butadiene homopolymers".

The Examiner's attention is called to the passage on page 6, from line 17 through line 28.

This passage recites the discovery of a cracking problem, the solution to which is achieved by compositions according to the claims.

The rejection of claims 8 and 31 (as amended) is respectfully traversed because the listed flexibilizers do not appear in either reference.

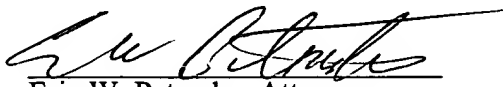
New claim 43 requires a particular advantageous material as flexibilizer.

New claim 44 adds the range limitation on the flexibilizer to the novel mixing method.

With respect to claims 13 and 36, the claimed improvement is counter-intuitive. Those skilled in the art are aware that crack suppression is best achieved by using long needle-shaped particles that overlap so that there is no clear path along which the crack can propagate. This is the structural basis for the use of fibers and cloth in crack suppression. Accordingly, the use of spherical or spheroidal particles would be thought by those skilled in the art to be ineffective in suppressing cracks, since their shape provides for the smallest amount of overlap.

For the foregoing reasons, allowance of the claims is respectfully solicited.

Respectfully submitted,
K. I. Papathomas

by: 
Eric W. Petraske, Attorney
Registration No. 28,459
Tel. (203) 798-1857

VERSION WITH MARKINGS TO SHOW CHANGES MADE

- 1 1. An encapsulant composition comprising:
2 a resin material selected from the group consisting of epoxy and cyanate ester
3 resins;
4 a flexibilizing agent comprising about 1 percent to about 5 percent by weight of
5 said composition; and
6 a filler material.

1 8. The composition of claim 1 wherein said flexibilizing agent is selected from the
2 group consisting of polysulfones, polyetherimide, polyamideimides, polyarylene ethers,
3 polyesters, polyarylates, polycarbonates, polyurethanes, hydroxy-terminated polysulfone
4 oligomers, 1,4-butane-diol diglycidyl ethers, neopentylglycol diglycidyl ether,
5 cyclohexane dimethanol diglycidyl ether, trimethylol ethane triglycidyl ethers,
6 dibromoneopentylglycol glycidyl ethers, propoxylated glycerol polyglycidyl ether,
7 polypropylene glycol glycidyl ether, polyglycidyl ether of castor oil, dimer acid
8 diglycidyl esters, resorcinol diglycidyl ether, epoxidized propylene glycol dioleates,
9 epoxy esters, 1,2-tetradecane oxides, internally epoxidized 1,3-butadiene
10 homopolymers, diglycidyl ether, glycidyl glycidate, bis(2,3-epoxy-2-methylpropyl)ether,
11 polyglycoldiepoxydes, E-caprolactone triol, copolymers of ~~butadiene~~ and styrene, butyl
12 rubber, neoprene, polysiloxanes, carboxyl terminated poly n-butylacrylates, maleic
13 anhydride terminated rubbers, epoxy functionalized rubbers, fluoridized rubbers, and
14 hydroxylated or carboxylated EPDM rubbers.

- 1 13. The composition of claim ~~10~~ 1, wherein said filler material comprises
2 substantially spherical or spheroidal particles, each particle having a diameter of less
3 than about 41 microns.

- 1 18. An electronic package comprising:
2 a substrate having an upper surface;
3 a semiconductor chip mounted on a portion of said upper surface of said
4 substrate and electrically coupled to said substrate, said semiconductor chip having a
5 bottom surface and at least one edge surface being substantially perpendicular to said
6 bottom surface; and
7 a material positioned on at least said portion of said upper surface of said
8 substrate and against at least a portion of said at least one edge surface of said
9 semiconductor chip, said material being an encapsulant composition which includes a

resin material, a flexibilizing agent comprising about 1 percent to about 5 percent by weight of said composition, and a filler material.

31. The electronic package of claim 18 wherein said flexibilizing agent is selected from the group consisting of polysulfones, polyetherimide, polyamideimides, polyarylene ethers, polyesters, polyarylates, polycarbonates, polyurethanes, hydroxy-terminated polysulfone oligomers, 1,4-butane-diol diglycidyl ethers, neopentylglycol diglycidyl ether, cyclohexane dimethanol diglycidyl ether, trimethylol ethane triglycidyl ethers, dibromoneopentylglycol glycidyl ethers, propoxylated glycerol polyglycidyl ether, polypropylene glycol glycidyl ether, polyglycidyl ether of castor oil, dimer acid diglycidyl esters, resorcinol diglycidyl ether, epoxidized propylene glycol dioleates, epoxy esters, 1,2-tetradecane oxides, internally epoxidized 1,3-butadiene homopolymers, diglycidyl ether, glycidyl glycidate, bis(2,3-epoxy-2-methylpropyl)ether, polyglycidiepoxydes, E-caprolactone triol, copolymers of ~~butadiene~~ and styrene, butyl rubber, neoprene, polysiloxanes, carboxyl terminated poly n-butylacrylates, maleic anhydride terminated rubbers, epoxy functionalized rubbers, fluoridized rubbers, and hydroxylated or carboxylated EPDM rubbers.

36. The electronic package of claim 18 wherein said filler material comprises substantially spherical or spheroidal particles, each particle having a diameter of less than about 41 microns.

41. A method of making an encapsulant composition, the method comprising the steps of:

providing a first quantity of resin material;

adding to said first quantity of resin material a second quantity of flexibilizing agent by homogenizing said flexibilizing agent in said first quantity of resin material by reacting said resin material and said flexibilizing agent together at a temperature of greater than about 100 degrees Celsius;

adding to said first quantity of resin material a third quantity of filler material;
and

blending said resin material.